WHAT IS CLAIMED IS:

1. A high strength cold rolled steel sheet consisting essentially of 0.0040 to 0.01% C, 0.05% or less Si, 0.1 to 1.0% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.01 to 0.14% Nb, and optionally 0.05% or less Ti, optionally 0.002% or less B, by weight, and a balance of substantially Fe and inevitable impurities; and satisfying the following formulae (6) and (7):

$$(12/93) \times Nb^*/C \geq 1.2 \qquad (6)$$

$$TS - 4050 \times Ceq \geq -0.75 \times TS + 380 \qquad (7),$$

wherein $Nb^* = Nb - (93/14) \times N$, $Ceq = C + (1/50) \times Si + (1/25) \times Mn + (1/2) \times P$,

TS denotes the tensile strength in MPa, and C, Si, Mn, P, N, and Nb denote the content in % by weight of carbon, silicon, manganese, phosphorus, nitrogen and niobium, respectively.

2. The high strength steel sheet of claim 1, further containing 0.05% or less Ti, by weight.

3. The high strength steel sheet of claim 1, further containing 0.002% or less B, by weight.

4. A high strength cold rolled steel sheet consisting essentially of: 0.0040 to 0.01% C, 0.05% or less P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.03% or less Ti, by weight, and Nb in an amount satisfying the following formula (8):

$$1 \leq (93/12) \times (Nb/C) \leq 2.5 \quad (8),$$

wherein C and Nb denote the content in % by weight of carbon and niobium, respectively; the high strength cold rolled steel sheet having a volumetric proportion of NbC of 0.03 to 0.10%; and 70% or more thereof being in a size of 10 to 40 nm.

5. A method for manufacturing a high strength cold rolled steel sheet, comprising the steps of:

(a) preparing a continuous casting slab of a steel which consists essentially of 0.0040 to 0.01% C, 0.05% or less P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.03% or less Ti, by weight, and Nb in an amount satisfying the following formula (8):

$$1 \leq (93/12) \times (Nb/C) \leq 2.5 \quad (8),$$

wherein C and Nb denote the content in % by weight of carbon and niobium, respectively;

(b) preparing a hot rolled steel sheet by finish rolling the slab from step (a) at reduction ratios satisfying the following formulae (9) through (11):

$$10 \leq HR1 \qquad (9)$$

$$2 \leq HR2 \leq 30 \qquad (10)$$

$$HR1 + HR2 - HR1 \times HR2/100 \leq 60 \qquad (11),$$

wherein HR1 and HR2 denote the reduction ratio in % in the finish rolling at the pass just before the final pass and the final pass, respectively;

(c) cold rolling the hot rolled sheet from step (b) and

(d) annealing the sheet from step (c).

6. A high strength steel sheet consisting essentially of 0.0040 to 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02 or less S, 0.01% to 0.1% sol.Al, 0.00100% or less N, 0.036 to 0.14% Nb, and optionally containing 0.0015% or less B, by weight, and satisfying the following formula (12):

$$1.1 < (Nb \times 12)/(C \times 93) < 2.5 \qquad (12),$$

wherein C and Nb denote the content in % by weight of carbon and niobium, respectively; the high strength steel sheet having an average grain size of 10 μm or less and an r value of 1.8 or more.

7. The high strength steel sheet of claim 6, further containing 0.0015% or less B, by weight.

8. The high strength steel sheet of claim 6, further containing 0.019% or less Ti, by weight, and satisfying the following formula (13):

$$Ti \leq (48/14) \times N + (48/32) \times S \quad (13),$$

wherein N, S, and Ti denote the content in % by weight of nitrogen, sulfur, and titanium, respectively.

9. The high strength steel sheet of claim 8, further containing 0.0015% or less B, by weight.

10. A method for manufacturing a high strength cold rolled steel sheet, comprising the steps of:

(a) preparing a continuous casting slab of a steel which consists essentially of 0.0040 to 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.0100% or less N, 0.036 to 0.14% Nb, by weight, and which satisfies the following formula (12):

$$1.1 < (Nb \times 12)/(C \times 93) < 2.5 \quad (12),$$

wherein C and Nb denote the content in % by weight of carbon and niobium, respectively;

(b) preparing a sheet bar by direct rolling or heating the slab from step (a) to a temperature of from 1100 to 1250°C followed by rough rolling;

(c) finish rolling the sheet bar from step (b) to a total reduction ratio of the pass just before the final pass and the final pass to produce a hot rolled steel sheet of 10 to 40%;

(d) coiling the hot rolled steel sheet from step (c) at a cooling speed of 15°C/sec or more to a temperature below 700°C, followed by coiling at a temperature of from 620 to 670°C;

(e) cold rolling the coiled hot rolled steel sheet from step (d) at a reduction ratio of 50% or more, followed by heating the steel sheet at a heating speed of 20°C/sec or more;

(f) annealing the steel sheet from step (e) at a temperature between 860°C and an Ar3 transformation temperature, and

(g) temper rolling the annealed steel sheet from step (f) at a reduction ratio of 0.4 to 1.0%.

11. A high strength cold rolled steel sheet consisting essentially of more than 0.0050% and not more than 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.01 to 0.20% Nb, by weight, and satisfying the following formulae (3), (4) and (14):

$$11.0 \leq r + 50.0 \times n \quad (3)$$

$$2.9 \leq r + 5.00 \times n \quad (4)$$

$$1.98\text{-}66.3 \times C \leq (Nb \times 12)/(C \times 93) \leq 3.24\text{-}80.0 \times C \quad (14),$$

wherein r denotes the r value, n denotes the n value at 1 to 5% strain, and C and Nb denote the content in % by weight of carbon and niobium, respectively.

12. The high strength steel sheet of claim 11, further containing 0.002% or less B, by weight.

13. A high strength cold rolled steel sheet containing essentially of more than 0.0050% and not more than 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.01 to 0.20% Nb, 0.05% or less Ti, and optionally 0.002% or less B, by weight, and satisfying the following formulae (3), (4) and (15):

$$11.0 \leq r + 50.0 \times n \quad (3)$$

$$2.9 \leq r + 5.00 \times n \quad (4)$$

$$1.98 - 66.3 \times C \leq (Nb \times 12)/(C \times 93) + (Ti^{*} \times 12)/(C \times 48) \leq 3.24 - 80.0 \times C \quad (15),$$

wherein r denotes the r value, n denotes the n value at 1 to 5% strain, Ti^{*} is not more than 0, and C, S, N, Nb, and Ti denote the content in % by weight of carbon, nitrogen, niobium, and titanium, respectively.

14. The high strength steel sheet of claim 13, further containing 0.002% or less B, by weight.

15. A method for manufacturing a high strength cold rolled steel sheet, comprising the steps of:

(a) preparing a continuous casting slab of a steel which consists essentially of more than 0.0050% and not more than 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1% sol.Al, 0.004% or less N, 0.01 to 0.20% Nb, by weight, and which satisfies the following formula (14):

$1.98 \times 66.3 \times C \leq (Nb \times 12)/(C \times 93) \leq 3.24 - 80.0 \times C$ (14),

wherein C and Nb denote the content in % by weight of carbon and niobium, respectively;

(b) preparing a coiled hot rolled steel sheet by finish rolling the slab from step (a) at a total reduction ratio of the pass just before the final pass and the final pass of 60% or less;

(c) cold rolling the hot rolled steel sheet from step (b) and

(d) annealing the sheet from step (c).

16. The method for manufacturing a high strength steel sheet of claim 15, wherein the finish rolling is conducted at a temperature of 870°C or higher, the coiling is conducted at a temperature of 550°C or higher, the cold rolling is conducted at a rolling reduction ratio of 50 to 85%, and the continuous annealing is conducted at a temperature of 780 to 880°C.

17. A method for manufacturing a high strength cold rolled steel sheet, comprising the steps of:

(a) preparing a continuous casting slab of a steel which consists essentially of more than 0.0050% and not more than 0.010% C, 0.05% or less Si, 0.10 to 1.5% Mn, 0.01 to 0.05% P, 0.02% or less S, 0.01 to 0.1 sol.Al, 0.004% or less N, 0.01 to 0.20% Nb, 0.05% or less Ti, by weight, and which satisfies the following formula (15):

$$1.98 \times 66.3 \times C \leq (Nb \times 12)/(C \times 93) + (Ti^{*} \times 12)/(C \times 48) \leq 3.24 - 80.0 \times C \qquad (15),$$

wherein $Ti^{*} = Ti-(48/14) \times N-(48/32) \times S$, $Ti^{*} = 0$ when Ti^{*} is not more than 0, and C, S, N, Nb, and Ti denote the content in % by weight of carbon, nitrogen, niobium, and titanium, respectively;

(b) preparing a coiled hot rolled steel sheet by finish rolling the slab from step (a) to a total reduction ratio of the pass just before the final pass and the final pass of 60% or less;

(c) cold rolling the hot rolled steel sheet from step (b) and

(d) followed by annealing the sheet from step (c).

18. The method of manufacturing a high strength steel sheet of claim 17, wherein the finish rolling is conducted at a temperature of 870°C or higher, the coiling is conducted at a temperature of 550°C or higher, the cold rolling is conducted at a rolling reduction ratio of 50 to 85%, and the continuous annealing is conducted at a temperature of 780 to 880°C